

Chapter 4. AQUATIC ANIMAL DISEASES OF CONCERN

4.1 Objective

A primary element of a national animal health management program is the identification of economically and biologically important diseases and their causative agents. A list of diseases is the starting point for establishing surveillance and monitoring efforts, developing management regions or zones, and creating the infrastructure necessary for implementing a health management program. This chapter will identify those infectious diseases around which the NAAHP will be built.

The NAAHP and the OIE Code define *disease* as a “clinical or non-clinical infection with one or more of the etiological agents of the *diseases* listed in this plan or the OIE Code”. The U.S. has a responsibility to report to the OIE the occurrence of an aquatic disease listed in its Aquatic Animal Code. However, the criteria and lists of diseases of regulatory importance to the U.S. are not identical to those of the OIE. For the NAAHP, the list of OIE “reportable” diseases will be included so practitioners and laboratories will be aware which OIE diseases need to be reported to government officials. Aquatic animal diseases of regulatory importance to the U.S., that is, those for which program standards are to be developed, will be listed separately along with the criteria used in their selection.

4.2 Criteria for U.S. Reportable Aquatic Animal Diseases (RAADs)

Identification or suspicion of the occurrence of one of the diseases which fit the criteria listed below requires reporting to the Federal *competent authorities*. The reporting process is delineated in Section 4.4.

For the purposes of the NAAHP, “suspicion” of the occurrence of a disease means observation of clinical signs or preliminary tests indicative of the presence of a pathogen that causes one of the reportable diseases.

- A. A disease on the list of OIE aquatic animal diseases (see Section 4.3 and most recent edition of the OIE Aquatic Animal Health Code),
- B. An emerging disease of previously un-described etiology which has the potential to seriously impact aquatic animal health and meets the following four criteria:
 - 1. The disease has been demonstrated to cause significant production losses due to morbidity or mortality. Mortality at or above 0.5%/day for any three consecutive days during disease episode is considered significant; OR, the disease has been demonstrated, or there is strong scientific evidence which suggests, that it negatively affects wild aquatic populations;
 - 2. Infectious etiology proven; OR, Infectious agent strongly associated with disease, but etiology is not yet known, and there is a potential for spread via live animals or their products.
 - 3. A repeatable, robust means of detection/diagnosis exists.
 - 4. Consensus is reached among the Federal competent authorities for listing the emerging disease as a RAAD.

4.3 List of U.S. Reportable Aquatic Animal Diseases (RAAD)

Fish:

- Epizootic hematopoietic necrosis
- Infectious hematopoietic necrosis
- Oncorhynchus masou virus disease
- Spring viremia of carp
- Viral hemorrhagic septicemia
- Viral encephalopathy and retinopathy
- Infectious pancreatic necrosis
- Infectious salmon anemia
- Red sea bream iridoviral disease
- Channel catfish virus disease
- White sturgeon iridoviral disease
- Bacterial kidney disease (*Renibacterium salmoninarum*)
- Enteric septicemia of catfish (*Edwardsiella ictaluri*)
- Piscirickettsiosis (*Piscirickettsia salmonis*)
- Epizootic ulcerative syndrome
- Gyrodactylosis (*Gyrodactylus salaris*)
- Emerging disease that fits the criteria in Section 4.2.

Mollusks:

- Infection with any of the following disease agents:
- Bonamia exitiosus
- Bonamia ostreae
- Marteilia refringens
- Marteilia sydneyi
- Marteilia chungmuensis
- Mikrocytos roughleyi
- Mikrocytos mackini
- Perkinsus olseni/atlanticus
- Candidatus Xenohalictis californiensis
- Haplosporidium nelsoni*
- Haplosporidium costale
- Perkinsus marinus
- QPX
- Emerging disease that fits the criteria in Section 4.2.

Crustaceans:

- Taura virus syndrome
- Yellowhead disease
- Spherical baculovirus (Penaeus monodon-type)
- Infectious hypodermal and hematopoietic necrosis

White spot disease
Tetrahedral baculovirus (Baculovirus penae)
Crayfish plague (*Aphanomyces astaci*)
Necrotizing hepatopancreatitis
Emerging disease that fits the criteria in Section 4.2.

Other species: None at this time

4.4 Reporting Process

The timely (within 24 hours) and accurate notification of the Federal competent authorities of the occurrence of a U.S. Reportable Aquatic Animal Disease is critical in order to implement disease management measures and inform other affected parties of the event. There is an expectation within and outside the U.S. that such a notification process takes place so that the Federal competent authorities (APHIS, FWS, and NOAA fisheries) can fulfill their mandated legal responsibilities. Further, the U.S. Veterinary Administration (Chief Veterinary Officer, APHIS) has a legal responsibility to notify the OIE in a timely fashion upon diagnosis of an OIE-listed disease. This notification is to take place by APHIS within 24 hours of confirmation. Listed below is a step-wise process by which reporting could occur in the U.S upon the preliminary diagnosis or suspicion of a RAAD and the subsequent confirmation of said disease. This suggested procedure is consistent with APHIS Veterinary Services Memorandum 567.6 – Reporting of aquatic diseases to the Office International des Epizooties (OIE).

Reporting of a RAAD or suspicion of a RAAD is required under the following conditions.

Reporting requirements:

- A. This is a new detection in the U.S., in a specified geographic zone (see Section 6.1, Zonation), or a re-occurrence in the U.S. or zone previously considered to be free of that disease, or
- B. Occurrence in a new host species, or
- C. New pathogen strain or disease manifestation, or
- D. Potential for international spread, or
- E. Zoonotic potential

Reporting procedure

- A. Aquatic animal health specialists, diagnostic laboratories, or USDA-accredited veterinarians, upon identification or suspicion of a RAAD, shall notify officials in their chain-of-command.
- B. The official from the state or federal office shall notify the APHIS Area-Veterinarian-In-Charge (AVIC).
- C. The AVIC in turn will immediately notify the State Veterinarian, the State Director(s) responsible for aquatic animal health management, the tribal representative if occurrence is on tribal reservation or property, and the APHIS Aquaculture Program Coordinator.
- D. The APHIS Aquaculture Coordinator will notify her/his counterparts in FWS and

NOAA Fisheries.

- E. Following notification, the AVIC and State/tribal officials will take steps to confirm the preliminary or suspicious finding, including submission of suspect material to a U.S. or OIE reference laboratory.
- F. Upon confirmation of a RAAD and meeting the reporting requirements above, the AVIC shall immediately notify the following: person making the original report/submission; the State Veterinarian; the State Director(s) of resource management; tribal authorities (if on tribal property), the Chief Staff Veterinarian, Emergency Programs; Assistant Director, Sanitary International Standards Teams; and, APHIS Aquaculture Program Coordinator.
- G. The APHIS Aquaculture Coordinator will notify her/his counterparts in FWS and NOAA Fisheries.
- H. APHIS, Veterinary Services, Headquarters, will notify OIE .

The following information will be provided to the AVIC upon preliminary findings or suspicion of a RAAD.

- A. Name, phone number, and address of person reporting the finding or suspicion of a RAAD.
- B. The location of the finding, address and GPS (if known) and name and phone number of person in charge of facility/resource area.
- C. The disease suspected or diagnosed
- D. The species of aquatic animal affected
- E. Approximate number of animals affected
- F. Measures being taken to prevent the spread of the disease
- G. Restrictions or quarantines, if any, placed on the facility/zone.

4.5 Data Storage Systems

There are currently in the U.S. many different locations and systems used to store information on the occurrence of diseases in aquatic animals. These systems range from records kept at an individual facility to national data bases maintained by the FWS and APHIS. Accurate and reliable data storage is essential to conduct epidemiological studies, implement disease prevention and control programs, and provide information to interested and affected parties in a timely manner.

APHIS operates a system with Veterinary Services called the National Animal Health Reporting System or NAHRS. This is a centrally-located system in Riverdale, Maryland.

FWS operates a data base to store the information they have gleaned from their National Wild Fish Health Survey. This database is presently located at Montana State University. All data is only entered by personnel at the FWS Fish Health Centers although actual fish samples can be submitted to the Fish Health Centers by many different entities. State, tribes and individual facility operators or resource managers also maintain disease reports in variety of measures. While this plan encourages the gathering of detailed health information, resources require that information submitted to a central, federal data base system be restricted at this time to RAADs . The information submitted for storage to the data base is listed in Section 4.4 above.

4.6 U.S. Program Aquatic Animal Diseases (PAADs)

A U.S. Program Aquatic Animal Disease (PAAD) is a disease that is a RAAD and for which there are specific measures in place by the Federal government in order to contain and eradicate or otherwise manage and control the spread of the given disease. Currently, there are two PAADs in the U.S. – infectious salmon anemia and spring viremia of carp. While there are several diseases listed as RAADs, only a subset of them will be considered for listing as PAADs, in addition to the two already listed. Criteria for listing as a PAAD are as follows:

- 1) The disease is a U.S. Reportable Aquatic Animal Disease
- 2) The disease is exotic to the U.S. or its distribution is very limited and is restricted to one or a few specified geographic regions or *zones*.
- 3) Measures can be implemented which have been demonstrated to successfully eradicate, control, and/or limit further dissemination of said disease.
- 4) Disease has been demonstrated to cause significant mortality and/or economic impact.
- 5) No effective treatment is known for the disease.

Suggested* list of PAADs:

Fish:

Epizootic hematopoietic necrosis (EHN)
Infectious hematopoietic necrosis (IHN)
Oncorhynchus masou virus disease (OMV)
Spring viremia of carp (SVC - currently an official program disease)
Viral hemorrhagic septicemia (VHS caused by highly pathogenic European strains)
Viral encephalopathy and retinopathy (VER)
Infectious pancreatic necrosis (IPN caused by known pathogenic strains)
Infectious salmon anemia (ISA - currently an official program disease)
Red sea bream iridoviral disease

Mollusks:

Bonamia exitiosus
Bonamia ostreae
Marteilia refringens
Marteilia sydneyi
Marteilia chungmuensis
Mikrocytos roughleyi
Perkinsus olseni/atlanticus
Candidatus Xenohaliotis californiensis
Haplosporidium nelsoni
Haplosporidium costale
Perkinsus marinus

QPX

Crustaceans:

- Taura virus syndrome
- Yellowhead disease
- Spherical baculovirus (Penaeus monodon-type)
- Infectious hypodermal and hematopoietic necrosis
- White spot disease
- Tetrahedral baculovirus (Baculovirus penae)
- Crayfish plague (*Aphanomyces astaci*)
- Necrotizing hepatopancreas disease (HPD)

* List provided by Work Group 2.

4.7 Recommendations

1. The list of U.S. Reportable Aquatic Animal Diseases (RAADs), and their associated criteria for listing as found in Sections 4.2 and 4.3, should be the official list for the U.S. Federal competent authorities. This list and criteria should be endorsed by States, tribes, and private industry.
2. The process for reporting the finding or suspicion of a finding of a RAAD, as described in Section 4.4, should be endorsed by the Federal competent authorities, State and tribal governments and private industry.
3. A single, centrally-located and managed Federal data system should be established for the implementation of NAAHP, as discussed in Section 4.5. As APHIS has existing infrastructure to support such a system in NAAHRS, the Task Force recommends that NAAHRS becomes the primary location for storing information on reportable aquatic pathogens. FWS, NOAA Fisheries, and Federal, State, tribal, and private industry should develop a common format to submit data to NAAHRS to make the process consistent and effective.
4. Resources should be allocated to enable NAAHRS to fulfill its recommended responsibilities under this chapter of the NAAHP.
5. It is understood by the federal competent authorities that States, tribes, or other legal government agencies may require additional reporting within their jurisdiction, of diseases not included on this list in Section 4.3.
6. It is recommended for the implementation of the NAAHP, that reporting is mandatory.
7. The list of U.S. Program Aquatic Animal Diseases (PAADs), and their associated criteria for listing as found in Sections 4.6, should become the official list for the U.S. Federal competent authorities after appropriate consideration and review by work groups, JSA, and stakeholders. After adoption in the NAAHP, this list should be endorsed by States, tribes, and private industry.
8. The list of PAADs will be finalized only after meeting with the species-specific program standard work groups and review and comment by JSA and stakeholders.
9. Following a finalized listing of PAADs, program standards will be developed and

listed in other chapters of the NAAHP.